It is to be noted that the aforementioned "adhesive strength of the IC chip 1 and the circuit board 4" means a force to make the IC chip 1 and the board 4 adhere to each other. With this regard, the IC chip 1 and the board 4 are bonded together by the three forces of an adhesive strength provided by the adhesive, a hardening shrinkage force when the adhesive is hardened, and a shrinkage force (for example, a shrinkage force generated when the adhesive heated to a temperature of, for example, 180°C shrinks when returning to the normal temperature) in the Z-direction.

(Eighth Embodiment)

A method and apparatus for mounting an electronic component of, for example, an IC chip on a circuit board and an electronic component unit or module of, for example, a semiconductor device in which the IC chip is mounted on the board by the mounting method, according to an eighth embodiment of the present invention will be described next with reference to Fig. 12 and Fig. 13. According to this eighth embodiment, the inorganic filler 6f mixed with the insulating resin 6m in each of the aforementioned embodiments has a mean particle diameter of not smaller than 3 μm. It is to be noted that the maximum mean particle diameter of the inorganic filler 6f is assumed to have a dimension that does not exceed the gap dimension

between the IC chip 1 and the board 4 after bonding.

If fine particles having a mean particle diameter smaller than 3 μm are used as the inorganic filler 6f when the insulating resin 6m is mixed with the inorganic filler 6f, then the surface area of those particles becomes large as a whole, and this possibly leads to moisture absorption to the periphery of the inorganic filler 6f of the particles that have a mean particle diameter smaller than 3 μm, which is disadvantageous in terms of the bonding of the IC chip 1 to the board 4.

Therefore, when the inorganic filler 6f of the same weight is mixed, the amount of moisture absorption to the periphery of the inorganic filler 6f can be reduced by employing a larger inorganic filler 6f that has a mean particle diameter of not smaller than 3 μm, and this allows the moisture resistance to be improved. Moreover, the inorganic filler of a larger mean particle diameter (in other words, average grain size) is generally less expensive, and this is preferable in terms of cost.

As shown in Fig. 24A, according to the processing method that employs the conventional ACF (Anisotropic Conductive Film) 598 for the bonding of the IC chip 1 to the board 4, it is required to place conductive particles 599 in the ACF 598 between the bump 3 and the board electrode 5 without fail and concurrently effect the

conductivity by crushing the conductive particles of a diameter of 3 to 5 μm to a diameter of 1 to 3 μm. However, in each of the aforementioned embodiments of the present invention, the conductive particles 10a, which may exist, are not necessarily be placed between the bump 3 and the board electrode 5. As shown in Fig. 24B, the bump 3 is pressure-bonded to the board electrode 5 while being crushed, and therefore, the inorganic filler 6f also slips out of the space between the bump 3 and the board electrode 4 together with the anisotropic conductive layer 10 located between the bump 3 and the board electrode 4 at the time of this pressure bonding. On the basis of the feature that almost no hindrance of conductivity occurs due to the placement of the unnecessary inorganic filler 6f between the board electrode 4 and the bump 3, the inorganic filler 6f that has a large mean particle diameter of not smaller than 3 μm can be employed. That is, according to the present embodiment, even if the conductive particles 10a are not placed between the bump 3 and the board electrode 5 by any chance and the conductivity is not effected by the crushing of the conductive particles that have a diameter of 3 to 5 μm to a diameter of 1 to 3 μm, the electrical conductivity is obtained by the direct electrical contact of the bump 3 with the board electrode 5 by virtue of the crushing of the bump 3 by the board electrode 5.